

REMARKS

This is intended as a full, complete, and timely response to the Office Action dated April 9, 2001, having a shortened statutory period for response set to expire on July 9, 2001. Applicants request entry and consideration of the following remarks.

Claim 1 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Tepman* (U.S. Patent No. 5,380,414) in view of *Ghanbari* (U.S. Patent No. 5,455,197). The Examiner takes the position the *Tepman* teaches a magnet array positioned within a chamber having a target, substrate, and a collimator. The Examiner states that the magnetic array is disposed within the chamber in order to form a magnetic field at the surface of the substrate, and further, that the magnetic array is considered to be annular in configuration, as the array is shown as being in the form of "U-shaped" closed loops with opposing magnetrons coming out of the plane of the page and forming a closed circular ring, as shown in Figure 2. The Examiner further takes the position that *Ghanbari* teaches that it is well known in the art to utilize concentrically positioned magnetic arrays. Therefore, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify *Tepman* with a concentrically positioned magnetic array from *Ghanbari*.

Applicants traverse this rejection and submit that the combination of *Tepman* and *Ghanbari* fails to teach, disclose, or suggest each of the elements recited in claim 1. In particular, Applicants submit that *Tepman* teaches a deposition chamber that may include one or more stationary U-shaped secondary magnetrons 11 that may be used to "shape the plasma and the flow of ions to the acceptor 10." (see column 4, lns 61-63) The secondary magnetron 11 is shown in Figure 2 using the same symbol as that used for the first magnetron 1, which is described as one or more magnets that may be rotated. (see column 1, lns 45-51) Applicants note that a rotating pair of magnets is not an annular magnet, and further, that a rotating pair of magnets does not generate a magnetic field that is parallel to the substrate surface, as recited in claim 1. The secondary magnetron is further described as being "coupled to the base of the acceptor 10" in a configuration that allows the magnetron of *Tepman* to be brought "up to the acceptor" from below during the pasting process. (see column 5, lns 23-28) *Tepman* does not teach an annular magnet array concentrically positioned about the surface of the substrate support, i.e., about the

perimeter of the substrate support and not below the substrate support, nor does *Tepman* teach the formation of a magnetic field that is substantially parallel to the surface of the substrate support, as recited in claim 1. Although the Examiner notes that Figure 2 is a sectional view of *Tepman*'s magnetron 11, and therefore concludes that the illustrated U-shaped magnetron 11 is annular, Applicants find no support for this conclusion in the drawings or description. Specifically, Applicants find no illustrative lines in the drawings that indicate that the U-shaped magnetrons 11 are in fact annular, as the Examiner concludes in the Office Action. Rather, as noted above, Applicants submit that one or more of the secondary magnetrons are rotated and not in fact annular in shape. *Ghanbari* teaches an apparatus for depositing a film on a semiconductor wafer having a "ring shaped auxiliary magnet 40" "surrounding the circular edge or periphery of the wafer 32." (see column 4, Ins 62-67 and Figure 1) However, the magnetron 40 is described as generating a magnetic field "that is perpendicular to the wafer 32" (see column 4, Ins 65-67), which is distinct from a field that is "substantially parallel to the surface of the substrate support," as recited in claim 1. Therefore, Applicants submit that the combination of *Tepman* and *Ghanbari* fails to teach, disclose, or suggest each of the limitations recited in claim 1, and as such, reconsideration of the rejection of claim 1 under 35 U.S.C. §103(a) is respectfully requested.

Claim 2 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Tepman* in view of *Ghanbari, et al.* as discussed with regard to claim 1, further in view of *Hsu* (U.S. Patent No. 5,589,039). The Examiner takes the position that *Hsu* teaches a target comprising a magnetic material that retains its magnetic properties upon deposition. Therefore, the Examiner concluded that the combination of *Tepman* and *Ghanbari*, as applied to claim 1, further in view of *Hsu* teaches each element of claim 2.

Applicants traverse this rejection and respectfully submit that the combination of references fails to teach, show, or suggest each of the limitations recited in claim 2. Applicants submit that *Hsu* teaches a biasing magnet structure for producing a parallel magnetic field that extends parallel to a substrate on which a magnetic thin film is deposited. The target material of *Hsu* is recited as being manufactured from a magnetic material. However, *Hsu* does not teach, show, or suggest an annular magnet array being concentrically positioned about the surface of a substrate support in order to provide a magnetic field that is substantially parallel to the surface

of the substrate support, as recited in claim 2. Therefore, Applicants submit that *Hsu* fails to further the teachings of *Tepman* and *Ghanbari* to the level necessary to support a rejection of claim 2 under 35 U.S.C. §103, as the combination of references fails to teach, disclose, or suggest the combination of elements expressly recited in claim 2. Therefore, reconsideration of the rejection of claim 2 under 35 U.S.C. § 103 over *Tepman*, *Ghanbari*, and *Hsu* is respectfully requested.

Claims 3, 5 and 6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Tepman*, *Ghanbari*, and *Hsu*, as discussed with regard to claim 2 above, further in view of *Boys* (U.S. Patent No. 4,500,409) and Applicant's admitted prior art. The Examiner takes the position that *Boys* teaches a long throw distance of at least 50 mm or a Ni/Fe alloy for the target, and therefore, the Examiner concludes that combination of references renders claims 3, 5, and 6 unpatentable. Applicants traverse this rejection and respectfully submit that although *Boys* teaches the use of a Permalloy target that is positioned 2.5 inches (63.5 mm) from the substrate, *Boys*, along with the cited combination of references, fails to teach, show, or suggest an annular magnet array being concentrically positioned about the substrate in order to generate a magnetic field that is substantially parallel to the substrate surface, as recited in claim 1, as well as claims 3, 5, and 6. Therefore, Applicants submit that *Boys* fails to further the teaching of *Tepman* and *Hsu* to the level necessary to support a rejection of claims 3, 5, and 6 under 35 U.S.C. § 103.

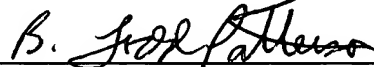
Claims 15, 16, and 18-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Alex* (U.S. Patent No. 5,616,218) in view of *Boys* and *Ghanbari*. The Examiner takes the position that *Alex* teaches a grounded collimator positioned between a target and a substrate and that *Boys* teaches a pressure of less than about 5 m Torr or a T/S distance of at least about 50 mm. The Examiner relies upon *Ghanbari* to teach a concentrically positioned magnet array forming a substantially parallel magnetic field. Applicants traverse this rejection and submit that the cited combination of references fails to teach, show, or suggest each of the elements or limitations recited in claims 15, 16, and 18-20. In particular, Applicants submit that *Alex* teaches a method for determining magnetic properties of a recording layer deposited through a sputtering process. The method described in *Alex* includes collimating during the sputtering process of a metal underlayer and then depositing a magnetic film on top of the under layer. However, *Alex* does not teach, disclose, or suggest the step of generating a magnetic field that is substantially parallel to the

substrate surface via an annular magnetic array that is concentrically disposed about the surface of the substrate. Further, *Alex* does not teach collimating sputtering of the target with a grounded collimator. Although the Examiner states that the collimator of *Alex* is requisitely grounded in that it is connected to the chamber wall that supports it, Applicants find no support for this conclusion in Figure 4 of *Alex* or the description thereof. Therefore, since both of these limitations are expressly recited in claim 15, Applicants respectfully submit that claim 15, along with dependant claims 16 and 18 - 20, recite subject matter that is neither disclosed, taught, nor suggested by the cited combination of prior art references. As such, reconsideration of the rejection of claims 15, 16, and 18 - 20 under 35 U.S.C. § 103(a) is respectfully requested.

In conclusion, Applicants submit that the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the apparatus and method the invention. Having addressed all issues set out in the Office Action, Applicants submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the Office Action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

Respectfully submitted,



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